BLMUC Series

Linear Motors

Ultra-compact size for tight space constraints; 52.0 mm x 20.8 mm cross section

Continuous force to 58.0 N (13.0 lb); peak force to 231.8 N (52.1 lb)

Non-magnetic forcer coil provides high force with zero cogging for super-smooth velocity and position control

Ideal for pick-and-place machines where Z-axis space is limited

Follows the 2011/65/EU RoHS 2 Directive

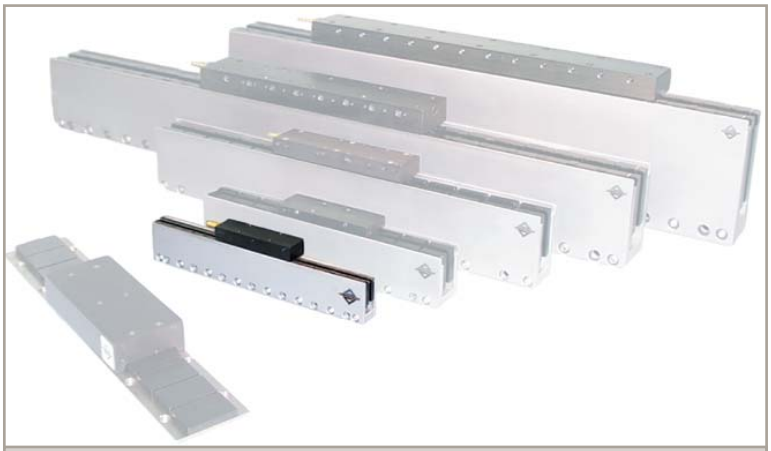
The BLMUC linear motor is an ultra-compact "U-channel" motor measuring only 52.0 mm x 20.8 mm in cross section, designed to provide high force in an ultra-compact package. The BLMUC is ideally suited for small load applications with tight space constraints such as a pick head on a pick-and-place machine, and low-mass, high-acceleration material handling machines.

The motor consists of a noncontact forcer coil assembly with Hall-effect devices, thermal sensor, and "U-channel" magnet track. This design eliminates backlash, windup, wear and maintenance issues associated with ball screws, belts, and rack and pinions.

The moving forcer coil assembly is a compact, reinforced ceramic epoxy structure. The ironless design eliminates cogging and eddy-current losses that otherwise would limit speed and produce additional heat. To produce the highest rms force, air cooling is standard.

These linear motors are ideal for any application that requires high levels of positioning resolution and accuracy. BLMUC series linear motors are forgiving to align, easy to assemble, and keep the magnetic field well-contained. Magnet tracks are stackable for any travel length. They are also suited for cleanroom use as they produce no particulates.

The BLMUC can be driven using standard Aerotech brushless amplifiers and controllers to provide a complete integrated system.



The BLMUC is shown with Aerotech's linear motor line.

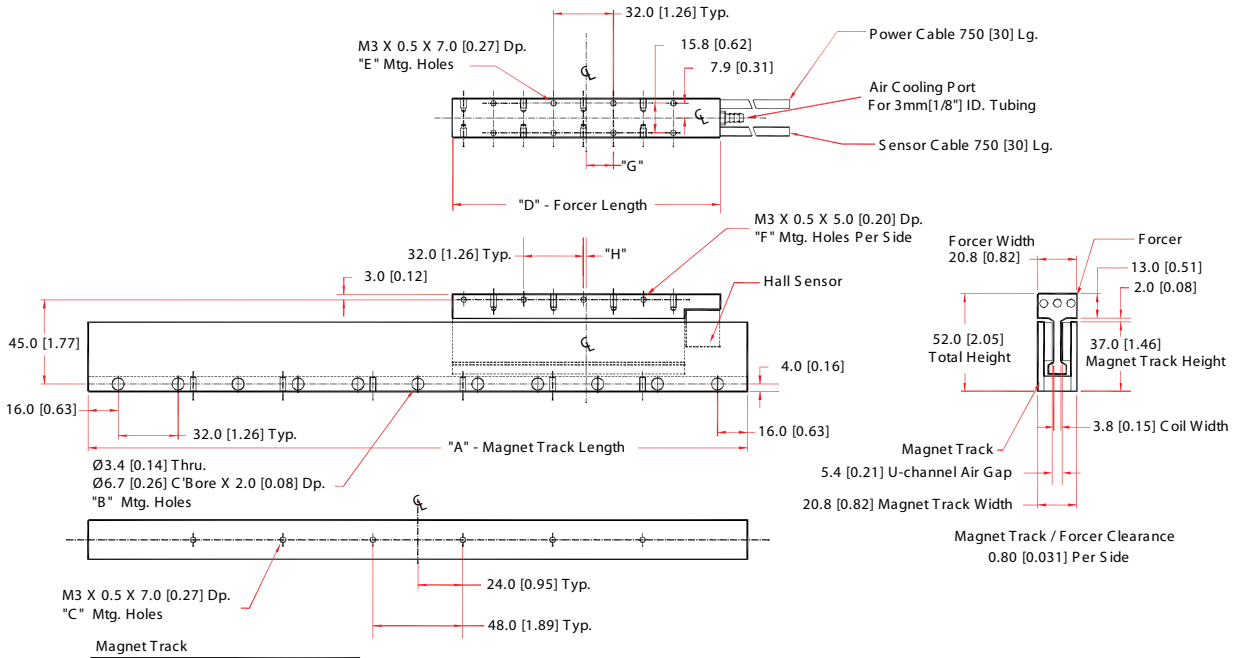
BLMUC Series SPECIFICATIONS

Motor Model	Units	BLMUC-79	BLMUC-95	BLMUC-111	BLMUC-143
Performance Specifications[1,2]					
Continuous Force, 1.4 bar (20 psi)[3]	N (lb)	31.4 (7.0)	40.5 (9.1)	46.9 (10.5)	58.0 (13.0)
Continuous Force, No Forced Cooling[3]	N (lb)	18.3 (4.1)	23.0 (5.2)	30.6 (6.9)	39.8 (9.0)
Peak Force[4]	N (lb)	125.4 (28.2)	161.9 (36.4)	187.6 (42.2)	231.8 (52.1)
Electrical Specifications[2]					
Winding Designation		**-A**	**-A**	**-A**	**-A**
BEMF Constant (line-line, max)	V/m/s (V/in/s)	6.80 (0.17)	9.00 (0.23)	11.35 (0.29)	15.90 (0.40)
Continuous Current, 1.4 bar (20 psi)[3]	Amp_{pk} Amp_{rms}	5.30 3.75	5.17 3.66	4.75 3.36	4.19 2.96
Continous Current, No Forced Cooling[3]	Amp_{pk} Amp_{rms}	3.10 2.19	2.94 2.08	3.10 2.19	2.88 2.04
Peak Current, Stall[4]	Amp_{pk} Amp_{rms}	21.20 14.99	20.68 14.62	19.00 13.44	16.76 11.85
Force Constant, Sine Drive[5,6]	N/Amp_{pk} (lb/Amp_{pk})	5.92 (1.33)	7.83 (1.76)	9.87 (2.22)	13.83 (3.11)
	N/Amp_{rms} (lb/Amp_{rms})	8.37 (1.88)	11.07 (2.49)	13.96 (3.14)	19.56 (4.40)
Motor Constant[3,5]	N/√W (lb/√W)	2.89 (0.65)	3.35 (0.75)	3.78 (0.85)	4.53 (1.02)
Resistance, 25° C, Line-Line	ohms	4.0	5.2	6.5	8.9
Inductance, Line-Line	mH	0.51	0.70	0.87	1.10
Thermal Resistance, 1.4 bar (20 psi)	°C/W	0.85	0.69	0.65	0.61
Thermal Resistance, No Forced Cooling	°C/W	2.48	2.12	1.52	1.29
Maximum Bus Voltage	VDC	340			
Mechanical Specifications					
Air Flow, 20 psi	m^3/s (SCFM)	$1.5x10^{-3}$ (3.12)	$1.5x10^{-3}$ (3.15)	$1.5x10^{-3}$ (3.22)	$1.5x10^{-3}$ (3.12)
Coil Weight	kg (lb)	0.10 (0.22)	0.12 (0.26)	0.14 (0.31)	0.20 (0.44)
Coil Length	mm (in)	80.0 (3.15)	96.0 (3.78)	112.0 (4.41)	144.0 (5.61)
Heat Sink	mm (in)	250x250x25 (10x10x1)	250x250x25 (10x10x1)	250x250x25 (10x10x1)	250x250x25 (10x10x1)
Magnet Track Weight	kg/m (lb/ft)	3.33 (2.23)			
Magnet Pole Pitch	mm (in)	16.00 (0.63)	16.00 (0.63)	16.00 (0.63)	16.00 (0.63)
Standards		2011/65/EU RoHS 2 Directive			

Notes:
1. Performance is dependent upon heat sink configuration, system cooling conditions, and ambient temperature.
2. All performance and electrical specifications ±10%.
3. Values shown @ 100°C rise above a 25°C ambient temperature, with motor mounted to the specified aluminum heat sink.
4. Peak force assumes correct rms current; consult Aerotech.
5. Force constant and motor constant specified at stall.
6. All Aerotech amplifiers are rated A_{pk}; use force constant in N/A_{pk} when sizing.
7. Maximum winding temperature is 125°C.
8. Ambient operating temperature range 0°C - 25°C. Consult Aerotech for performance in elevated ambient temperatures.

The BLMUC linear motor is used in Aerotech's high-performance ALS130 positioning stage.

BLMUC Series DIMENSIONS



Magnet Track

Model No.	A	B	C
MTUC64	64.0 [2.52]	2	0
MTUC96	96.0 [3.80]	3	2
MTUC128	128.0 [5.04]	4	2
MTUC160	160.0 [6.30]	5	2
MTUC192	192.0 [7.56]	6	4
MTUC224	224.0 [8.82]	7	4
MTUC256	256.0 [10.08]	8	4
MTUC288	288.0 [11.34]	9	6
MTUC352	352.0 [13.86]	11	6
MTUC416	416.0 [16.38]	13	8

Dimensions - millimeters [inches]

Forcer

Model No.	D	E	F	G	H
BLMUC-79	80.0 [3.15]	4	2	14.0 [0.55]	2.0 [0.08]
BLMUC-95	96.0 [3.78]	6	2	22.0 [0.87]	26.0 [1.02]
BLMUC-111	112.0 [4.41]	6	3	30.0 [1.18]	18.0 [0.71]
BLMUC-143	144.0 [5.67]	8	4	14.0 [0.55]	2.0 [0.08]

BLMUC Series ORDERING INFORMATION

Ordering Example

BLMUC-79-A	-AC	-NH	-S	-750	-MTUC96
Series	Air Cooling	Hall Effect	reparation	Cable Length	Magnet Track
BLMUC-79-A BLMUC-95-A BLMUC-111-A BLMUC-143-A BLMUC-x-x	-AC -NC	-H -NH	-S -V -UHV	-750 -5000	MTUC96 MTUC128 MTUC160 MTUC192 MTUC224 MTUC256 MTUC288 MTUC352 MTUC416 MTUCx

BLMUC Brushless Linear Servomotor

BLMUC-79	Linear motor forcer with hall effect sensors and thermistor, 18.3 N (4.1 lb) continuous force with no cooling
BLMUC-95	Linear motor forcer with hall effect sensors and thermistor, 23 N (5.2 lb) continuous force with no cooling
BLMUC-111	Linear motor forcer with hall effect sensors and thermistor, 30.6 N (6.9 lb) continuous force with no cooling
BLMUC-143	Linear motor forcer with hall effect sensors and thermistor, 39.8 N (9 lb) continuous force with no cooling
BLMUC-X-X	Linear motor forcer with hall effect sensors and thermistor

Winding

-A	76 cm (2.5 ft) flying leads std

Air Cooling

-AC	Includes air cooling fitting
-NC	No air cooling fitting is installed

Hall Effect

-H	Hall effect sensors included
-NH	No hall effect sensors

Preparation

-S	Standard preparation
-V	Vacuum preparation for 10^{-6} Torr
-UHV	Ultra-high vacuum preparation, contact factory

Cable Length

-750	750 mm high-flex cable
-5000	5.0 m high-flex cable

Magnet Tracks

MTUC96	"U" channel magnet track for use with BLMUC-series forcers, 96 mm (3.8 in) length
MTUC128	"U" channel magnet track for use with BLMUC-series forcers, 128 mm (5.0 in) length
MTUC160	"U" channel magnet track for use with BLMUC-series forcers, 160 mm (6.3 in) length
MTUC192	"U" channel magnet track for use with BLMUC-series forcers, 192 mm (7.6 in) length
MTUC224	"U" channel magnet track, for use with BLMUC-series forcers, 224 mm (8.8 in) length
MTUC256	"U" channel magnet track for use with BLMUC-series forcers, 256 mm (10.1 in) length
MTUC288	"U" channel magnet track for use with BLMUC-series forcers, 288 mm (11.3 in) length
MTUC352	"U" channel magnet track for use with BLMUC-series forcers, 352 mm (13.9 in) length
MTUC416	"U" channel magnet track for use with BLMUC-series forcers, 416 mm (16.4 in) length
MTUCx	Custom "U" channel magnet track for use with BLMUC-series forcers